

# Online Master Program in System Technology

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## Abstract

The University of Louisiana at Lafayette proposed the creation of a Master of Science in Systems Technology (STEC) in 2013 to the State of Louisiana Board of Regents which was approved in 2014. The delivery of the new MS degree was 100% online to facilitate access to a wide student base within the state of Louisiana and beyond. The objective of Systems Technology education intends to equip students with the knowledge base, skill set and cutting-edge tools to develop solutions to complex systems problems in a diversity of industries. It is designed for industrial and engineering technologists, and other professionals engaged in developing systems to meet required specifications.

## 1. Introduction

A Systems Technology approach enables individuals to address existing and emerging challenges in many fields of great interest to Louisiana industries including energy conservation management and production, instrumentation calibration, process controls, monitoring systems, test procedures, safety and loss prevention, quality control, process operations, and systems management. It provides broad-based mechanisms that address the analyses of goals and requirements, economic implications, design-life considerations, and the organization of multidisciplinary teams oriented toward solving highly complex problems pertaining to both the economic and technical challenges of a total system. It is an interdisciplinary approach formulated to enable the realization of successful systems. Example systems include coastal ecosystems, water management, new generation natural gas production, digital networks, visualization frameworks, deep-water drilling operations, highway safety systems, CleanTech production facilities, robotics units, refineries, fiber optics networks, aircraft systems, automotive systems, manufacturing, biomass conversion processes, management of utilities during disaster events, chemical production, and power grids.

There are fundamental differences between Systems Technology and Engineering Management. Systems Technology is based upon algebraic methods, whereas engineering management is a calculus-based program which focuses on problem solutions and associated designs. Often, the engineer is the project lead in assessing and generating the solutions to complex problems. Engineering education integrates problem identification, design, advanced scientific concepts, project economics, and project management. Technology education is algebra-

based and integrates a very different skill set of learned aspects directed toward similar general topical areas which are critical to industry. Technologists generally take part in implementing solutions.

## 2. The Need for the Program

The new degree is aligned with University priorities as stated in the mission and vision statements that advocate a commitment to graduate education; particularly, those that are a driver toward increased economic development within the state. Further, UL Lafayette's ability to offer this degree program directly contributes to the accomplishment of several of the institution's objectives articulated in the 2009-2014 Strategic Plan related to (a) increasing the number of graduates in high-demand professions, (b) growing select graduate programs that will be unique and result in significant in-state employment opportunities in the Emerging Industry Sectors for Louisiana, as recently identified by the Louisiana Department of Economic Development, and (c) increase high-quality online offerings when programs have broad-based geographic appeal [1].

There are no universities in the State of Louisiana or in the Gulf South region that offer an MS in Systems Technology. A thorough review of institutions that offer some similar program aspects was performed. It is noteworthy to mention that after this review, UL Lafayette was even more excited about the potential and value of this program and how it better positioned Louisiana for offering a stronger workforce to current and/or potential new industries.

## 3. Students

### 3.1 Recruitment and Admission Requirement

The University of Louisiana at Lafayette offers an undergraduate program in Industrial Technology which enrolls about 400 students and produces approximately 100 graduates each year. Since 1986, there have been over 2,000 graduates from the Industrial Technology undergraduate program, with approximately 70 percent residing in Louisiana. Although former and graduating students expressed interest in advancing their education within the discipline at UL Lafayette, there was no program in the state of Louisiana to meet their educational needs.

All STEC applicants are admitted to the University Graduate School. Admission to the Master of Science in Systems Technology is based on assessment of the applicant's score on the Graduate Record Examination, the undergraduate academic record, and letters of

recommendation from undergraduate professors or employers.

Students pursuing a Master of Science in Systems Technology can select from either a 30-hour thesis or 33-hour project option. Both options require completion of a 12 hour core and 12 elective hours. The 30-hour thesis option is completed with 6 hours of thesis, and the 33-hour project is completed with 3-6 hours of project courses and additional departmental elective(s). All students must pass a comprehensive oral exam and make a formal presentation of the student's thesis or project. The following courses and rotation schedule are utilized for the Systems Technology curriculum. Topic areas were developed with faculty, industry, alumni and industrial advisory board feedback [2].

### 3.2 STEC Courses

#### Core Courses

- 500. System Planning and Control.
- 501. Analysis in Systems Technology
- 502. Total Quality Control.
- 503. Research Methods
- 504. Advanced Systems Analysis
- 522. Process Control Systems Technology
- 525. Automated Systems Management

#### Electives

- 510. Advanced Safety & Reliability
- 511. Entrepreneurship in Systems Technology
- 512. Composite Materials
- 513. Statistical Systems Analysis
- 514. Alternative Energy Systems Technology
- 515. Logistics
- 594. Project Research
- 595. Special Topics
- 597-598. Directed Individual Study
- 599. Thesis

## 4. Enrollment & Graduation Report

### 4.1 SACS Approval

The M.S. in Systems Technology program was approved by the Southern Association of Colleges and Schools (SACS) on February 3<sup>rd</sup>, 2014.

### 4.2 Enrollment Data

The program has a diverse population that includes male and female U.S. students (including African American students), as well as, South American students. Their educational background is also diverse, grounded in a variety of Engineering and Technology fields that include: Industrial Technology, Chemical Engineering, Industrial Engineering, Mechanical Engineering, and Engineering Technology.

Enrollment – Graduate Program: Declared Majors	
Fall 2014	9
Spring 2015	13
Fall 2015	17

Spring 2016	20
Fall 2016	17
Spring 2017	17
Fall 2017	18
Spring 2017	17

### Completer (MS Degree) Data

Completers	
Fall 2014	0
Spring 2015	0
Fall 2015	0
Spring 2016	2
Fall 2016	3
Spring 2017	1
Summer 2017	1
Fall 2017	4
Spring 2018	Expected 3

## 4. Future Plan

### 4.1 Faculty Training and Participation

Currently six faculty are ULearn Certified Online Teachers [2]. Such certification includes completion of Quality Matters training as well as three workshops offered through the Sloan Consortium. All new faculty hires become ULearn certified to support the program. Faculty from all other departments of the college of engineering are encouraged to participate in STEC student projects and research.

### 4.2 Rigorous Recruiting

More recruiting efforts are planned to increase the number of students in the program. Some of the efforts are developed and maintain an internal database of all department graduates since 2007. Use the database for email solicitations to UL Lafayette College of Engineering graduates. The emails includes a letter, with a marketing brochure, describing the program and contact persons for more information. Make presentations about the Master's program to several groups, and disseminate program fliers at various conferences. Send email solicitations to local and regional companies that typically hire engineering and technology graduates.

## References

- [1] Lafayette Economic Development Authority, <http://www.lafayette.org/site323.php>
- [2] UL System Technology Program, <https://itec.louisiana.edu/programs/masters>
- [3] UL Distance Learning, <https://distancelearning.louisiana.edu/>